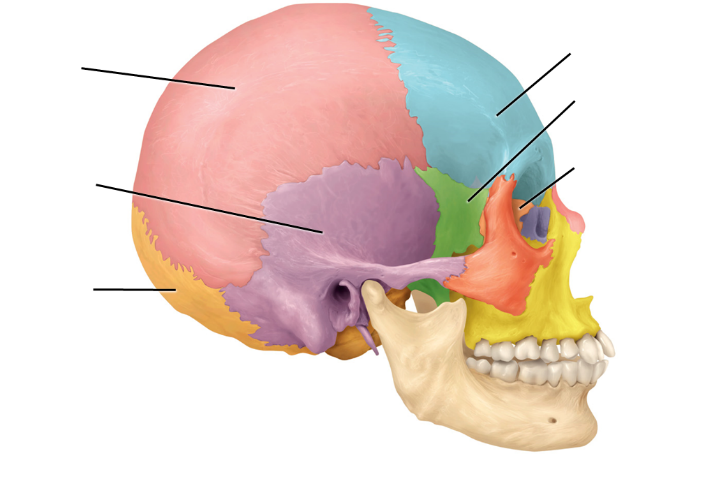
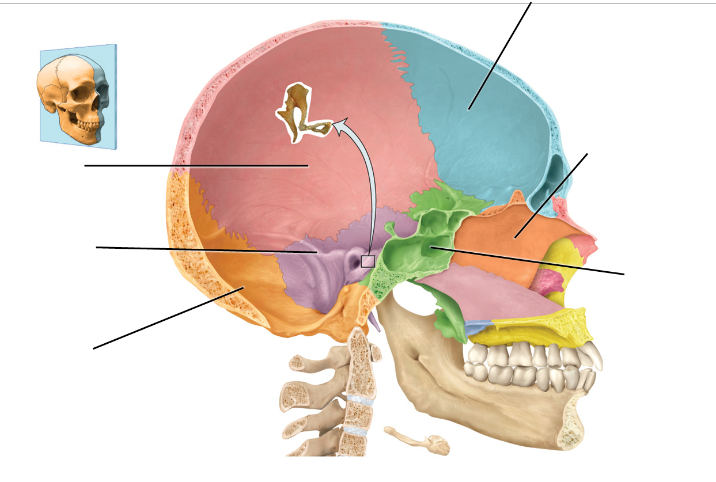
Axial vs. Appendicular Skeleton

* **axial skeleton:** consists of the bones that lie around the longitudinal \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of the body
* **appendicular skeleton:** consists of bones of the upper and lower \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ + the bones forming the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_: connecting limbs to the axial skeleton

Cranial Bones

* **skull:** bony framework of the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, 22 bones
  + **cranial bones:** those that form the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ cavity (8)

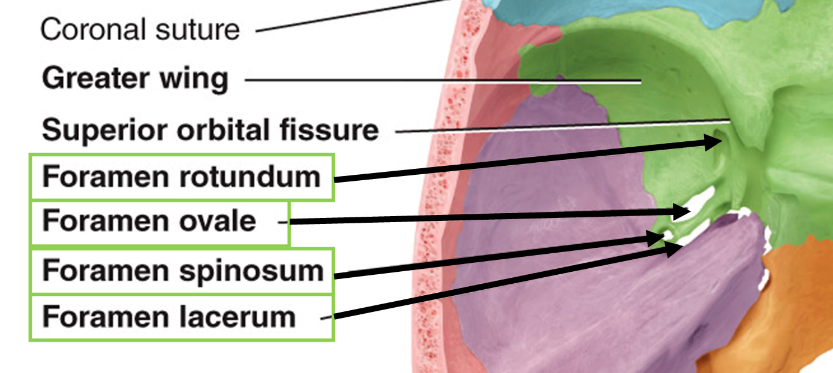
 

Sphenoid bone

* **sphenoid bone:** lies at the middle part of the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of the skull  
  🡪 “keystone” of the cranial floor b/c it articulates with all the other cranial bones  
  🡪 houses some notable foramen = openings thru which vessels, nerves, ligaments pass

A diagram of the bones of the human body

Description automatically generated A close-up of a skull

Description automatically generated 

* **optic foramen (canal)**: transmits the optic nerve (CN II) and the ophthalmic artery
* **superior orbital fissure**: transmits the trigeminal (CN V), abducens (CN VI), trochlear (CN IV), and oculomotor nerve (CN III)
* **inferior orbital fissure**: transmits branches of the trigeminal (CN V)
* **foramen rotundum**: transmits the maxillary (branch of CN V, trigeminal)
* **foramen ovale**: transmits mandibular nerve (branch of CN V, trigeminal)
* **foramen spinosum**: transmits the anterior branch of the middle meningeal artery
* **foramen lacerum**: transmits branch of ascending pharyngeal artery

Ethmoid bone

* **ethmoid bone:** forms the…
* [1] anterior part of the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ floor
* [2] medial wall of the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* [3] superior portion of the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* [4] most superior supporting structure of the nasal cavity

**[1] cribriform plate**: lies in the anterior floor of the cranium and forms the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  
🡪 contains the olfactory foramina through which the olfactory nerves pass

**[2] crista galli**: projects superiorly from the cribriform plate and serves as a point of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ for the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_: membrane that separates brain hemispheres

**[3]** **perpendicular plate**: projects inferiorly from the cribriform plate and forms the superior portion of the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**[4] lateral masses:** contain air spaces called ethmoidal cells that form the ethmoidal sinus

* superior nasal concha and middle nasal concha: increase vascular and mucus membrane \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ in nasal cavity which warms and moistens inhaled air before it passes into the lungs

A diagram of the skull

Description automatically generated A diagram of the human body

Description automatically generated

Cranial Bones – Sutures

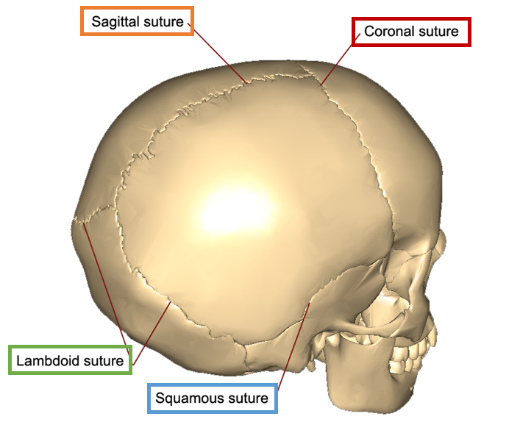
* **suture**: an immovable joint (in adults) that holds most \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ bones together  
  🡪 sutures in the skull of infants and children are often movable and function as growth centers

[1] **coronal suture:** unites \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ bone with both parietal bones

[2] **sagittal suture:** unites the 2 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ bones

[3] **lamboid suture:** unites the 2 parietal bones with the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ bone

[4] **squamous sutures** (2): unites the parietal and temporal bones on the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ aspects of the skull



Cranial Bones – Fontanels

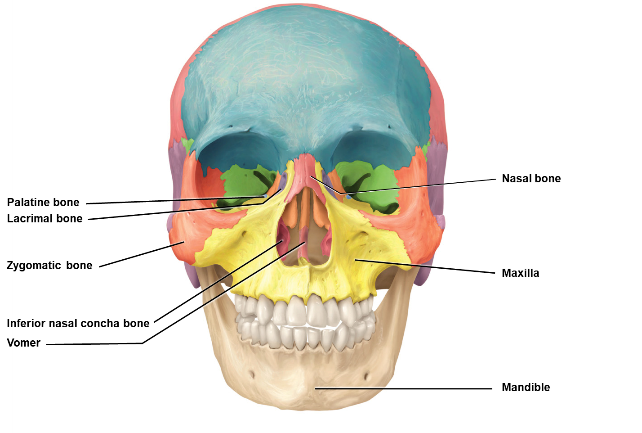
* **fontanel** (aka “\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_”): areas where unossified mesenchyme develops into dense connective tissue of the skull   
  🡪 as bone formation continues after birth, the fontanels are eventually replaced with bone and the thin collagenous connective tissue junctions that remain between neighboring bones become the sutures

A skull with different colored parts

Description automatically generated

Facial Bones

* **skull:**  
  [2] **facial bones:** form the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (14)



* **maxillae (2):** bones of the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  
  🡪 articulate with every bone of the face except the mandible (lower jaw)   
  🡪 forms part of the orbits, part of the nasal cavity, and most of the hard palate (bony roof of the mouth)  
  🡪 each maxilla contains a large maxillary sinus that empties into the nasal cavity   
  🡪 the alveolar processes of the maxilla are ridge-like arches that contain the alveoli (sockets) for the maxillary (upper) teeth
* **mandible:** largest, strongest facial bone that forms the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  
  🡪 mental foramen: transmits terminal branches of alveolar nerve and mental vessels   
  🡪 mandibular foramen: transmits mandibular nerve and blood vessels
* **inferior nasal conchae (2):** form part of (and project into) the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ cavity  
  🡪 separate bones from nasal conchae of the ethmoid bone  
  🡪 all three pairs of nasal conchae (superior, middle, inferior) increase the surface area of the nasal cavity and help swirl and filter air before it passes into the lungs
* **nasal bones (2):** small, flattened rectangular   
  shaped bones that form the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of the nose
* **vomer:** triangular bone that forms the nasal \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (along with the ethmoid)  
  🡪 nasal septum = the partition that divides the nasal cavity into L/R sides
* **lacrimal bones (2):** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ bones of the face  
  🡪 lacrimal fossa: vertical tunnel formed with the maxilla that houses the lacrimal sac which gathers tears
* **zygomatic bones (2):**  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, form the prominences of the cheeks and part of the orbit   
  🡪 zygomatic arch: the temporal \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of the zygomatic bone projects posteriorly and articulates with the zygomatic process of the temporal bone
* **palatine bones (2):** form the posterior portion of the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, part of the nasal cavity, and a small portion of the orbits

Special Structures

* **hard palate:** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of the mouth, formed from **maxillae + palatine**
* **nasal septum:** separates nose into left and right, composed of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**,** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ **bone (perpendicular plate),** and\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ cartilage
* **orbit:** (aka orbital cavity, eye socket) contains the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and associated structures  
  🡪 comprised of 3 cranial bones = **frontal, sphenoid, ethmoid** 4 facial bones = **palatine, zygomatic, lacrimal, maxilla**
* **paranasal sinuses:** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ within certain cranial and facial bones near the nasal cavity  
  🡪 lined with mucus membranes that are continuous with the lining of the nasal cavity  
  🡪 sinuses increase the surface area of the nasal mucosa, thus increasing the production of mucus to help moisten and cleanse inhaled air  
  🡪 small or nearly absent at birth, allow the skull to increase in size without a change in the mass of the bone

A close-up of a human body

Description automatically generated A skull with the names of the bones

Description automatically generated with medium confidence

Hyoid Bone

* **hyoid bone   
  🡪** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ with ANY other bone   
  🡪 suspended from the styloid processes of the temporal bones by ligaments and muscles   
  🡪 supports the tongue, providing attachment sites for some tongue muscles and for muscles of the neck and pharynx

Vertebral Column

* **vertebral column** (aka “spine” “backbone” “spinal column”)  **🡪** makes up about \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of your total height   
  🡪 contains a series of bones called **vertebrae** organized into 5 regions  
   [1] cervical [2] thoracic [3] lumbar [4] sacral [5] coccygeal

A diagram of the spine

Description automatically generatedA diagram of the spine

Description automatically generated

* **vertebral body:** the thick, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_-\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ anterior portion; the weight-bearing part of the vertebra
* **vertebral foramen:** accommodates the spinal \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* **processes**: 7 processes arise from the vertebral arch   
   [1] transverse process - (2) extends \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ on each side   
   [2] spinous process – projects \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ from the junction of the laminae   
   [3] superior articular processes – (2) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ with the 2 inferior articular processes \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ them   
   [4] inferior articular processes – (2) articulate with the 2 superior articular processes \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ them
* **intervertebral discs:** fibrocartilage \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ the bodies of adjacent vertebrae from the 2nd cervical vertebra to the sacrum  
  🡪 fun fact: you are slightly shorter at night because over the course of the day, the discs compress and lose water
* **cervical vertebrae:** C1-C7  
  🡪 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ than all other vertebrae, except those that form the coccyx  
  🡪 have 3 foramina: 1 vertebral foramen and 2 transverse foramina (vertebral artery and vein)  
   **C1 = ATLAS   
   C2 = AXIS**
* **thoracic vertebrae:** T1-T12  
  🡪 considerably larger and stronger than cervical vertebrae  
  🡪 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ with the ribs
* **lumbar vertebrae:** L1-L5  
  🡪 largest, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of the unfused bones in the vertebral column  
  🡪 the spinous processes are well adapted for the attachment of the large back muscles
* **sacrum:** large triangular bone formed by the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of 5 sacral vertebrae (S1-S5)  
  🡪 sacral vertebrae begin to fuse between 16-18 years of age (process completed by 30)   
  🡪 serves as foundation for the pelvic girdle
* **coccyx** (aka “\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_”): small triangular bone formed by the union of 4 coccygeal vertebrae (Co1-Co4)   
  🡪 fusion occurs between the age of 20-30
* the female sacrum is shorter, wider, and more curved between S2-S3

Thoracic Cage

* **thoracic cage:** bony \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ formed by the [1] sternum, [2] ribs and their [3] costal cartilages, and the bodies of the thoracic vertebrae
* **sternum** (aka \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_): flat, narrow bone located in the center of the anterior thoracic wall

[1] **manubrium:** the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ portion

[2] **body:** the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and largest part

[3] **xiphoid process**: inferior and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ part

* **ribs:** 12 pairs, numbered 1-12 from superior to inferior   
  🡪 give structural support to the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of the thoracic cavity   
  🡪 each rib articulates posteriorly with its corresponding thoracic vertebra
* **true ribs** = those that have costal cartilages that attach \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to the sternum (1-7)  
  **false ribs** = costal cartilages either attach \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to the sternum or do not attach to the sternum at all (8-12)

Clinical Connection

* **scoliosis:** increased \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ curvature
* **kyphosis:** increased \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ curvature, bent forward
* **lordosis:** increased \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ curvature, bent backwards
* **herniated disc:** results from \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of an intervertebral disc   
  🡪 the soft inner portion of the disc (nucleus pulposus) protrudes outside through the hard outer ring (annulus fibrosus)  
  🡪 causes pain when a nerve is compressed  
  🡪 can be precipitated by strain, injury, and aging
* **spina bifida:** is a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ neural tube defect in which the spinal column does not form properly and neural tissue protrudes from an opening in the back